7-1 LIMS (Rev. 10-2-17)

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FBI Laboratory

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LABORATORY REPORT

To: JENNIFER TERAMI
SPECIAL AGENT
Seattle

Date: March 13, 2020

Case ID No.: SE-3120298

Lab No.: 2019-01736-16

Communication(s): August 5, 2019; February 20, 2020

Agency Reference(s):

Subject(s):

Victim(s):

Discipline(s): Firearms/Toolmarks

FBI Laboratory Evidence Designator(s):

Item 20	Metal fragments from brain of C[redacted]E[redacted] (1B1, E5283658)
Item 20-1	Bullet fragment from brain of C[redacted]E[redacted] (1B1, E5283658)
Item 21	Metal fragments from brain of T[redacted]H[redacted] (1B2, E5283659)
Item 21-1	Bullet fragment from brain of T[redacted]H[redacted] (1B2, E5283658)
Item 22	Metal fragments from head of M[redacted]S[redacted] (1B3, E5283660)
Item 23	Metal fragments from behind right clavicle of D[redacted]O[redacted] (1B4, E5283661)
Item 24	Metal fragments from nasal cavity of D[redacted]O[redacted] (1B5, E5283662)
Item 25	Metal fragments from brain of J[redacted]C[redacted] (1B6, E5283663)
Item 26	Debris from chest of J[redacted]C[redacted] (1B7, E5283664)
Item 27	Wad from door pocket of 1999 Ford F250 (1B27, E5283684)
Item 28	Wad from bed of 1999 Ford F250 (1B31, E5283688)
Item 42	Shotshell case from driveway at 5151 Medicine Valley Road (1B127, E5283784; YSO Item 021)
Item 43	Shotshell case from driveway at 5151 Medicine Valley Road (1B128, E5283785; YSO Item 022)

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Item 44	Shotshell case from driveway at 5151 Medicine Valley Road (1B129, E5283786; YSO Item 023)
Item 56	Cartridge from chamber of Item 64 Ruger rifle, Serial Number 25985399 (1B12, E5283669)
Item 57	Magazine from canal (1B13, E5283670)
Item 58	Six cartridges from Item 57 Magazine (1B13, E5283670)
Item 64	Ruger rifle, Serial Number 25985399, from canal (1B11, E5283668)
Item 108	Cartridge case (1B131, E5283788)
Item 109	Cartridge case (1B134, E5283791)
Item 110	Cartridge case (1B136, E5283793)
Item 111	Cartridge case (1B146, E5283803)
Item 112	Cartridge case (1B198, E5283936)
Item 113	Cartridge case (1B200, E5283938)
Item 114	Cartridge case (1B205, E5283943)
Item 115	Cartridge case (1B205, E5283943)
Item 116	Cartridge case (1B205, E5283943)
Item 117	Cartridge case (1B210, E5283948)
Item 118	Cartridge case (1B282, E6502154)
Item 119	Cartridge case (1B283, E6502155)
Item 120	FTU Secondary Evidence (6 cartridge cases, 6 bullets)

The results of the firearms examinations and national database searches are included in this report.

Results of Examinations:

The Item 64 is a .22 Long Rifle caliber Ruger rifle, Model 10/22, which functioned when tested in the Laboratory with the Item 57 magazine. Both the Item 64 rifle and Item 57 magazine were heavily soiled when received in the Firearms/Toolmarks Unit. Upon lubrication, the Item 64 rifle functioned normally with use of a magazine from the Laboratory's Reference Firearms Collection. The Item 57 magazine follower failed to consistently feed cartridges to the top of the magazine. Also, the Item 57 magazine fit in and functioned with the Item 64 rifle, but would not lock into the magazine well due to a broken magazine locking post.

A query of the National Crime Information Center (NCIC) database was performed and no records were found at this time. Images of a test-fired specimen from the Item 64 rifle were entered into the National Integrated Ballistic Information Network (NIBIN) and searched within

the zone that includes Washington. An image of a cartridge case from the Item 64 rifle is similar to an image that was entered in connection with Yakima County Sheriff's office, case number 11-05925. This evidence needs to be submitted to the Laboratory for a direct comparison to determine if an association exists with the Item 64 rifle.

The Item 108 through Item 119 cartridge cases were identified as having been fired in the Item 64 rifle.

Item 42, Item 43 and Item 44 are 12 gauge shotshell cases bearing the headstamps of Remington, Federal and Winchester ammunition respectively. The Item 42, Item 43 and Item 44 shotshells were identified as having been fired in the same shotgun and were eliminated as having been fired in the Item 64 rifle. Images of the Item 43 shotshell were entered into NIBIN and searched within the zone that includes Washington. No associations were found at this time.

Item 20-1 and Item 21-1 are .22 caliber deformed bullet fragments. Item 23 is a deformed bullet fragment of unknown caliber. The Item 21-1 was fired from a barrel rifled with six grooves, right twist. Item 20-1 was fired from a barrel with six grooves, but a directionality of the twist could not be determined. A check of the FBI Laboratory's GRC database produced a list of firearms with GRCs like those present on the Item 20-1 and Item 21-1 that was too voluminous for meaningful value due to the limited measureable characteristics on these items. Due to a lack of sufficient corresponding microscopic marks of value, no conclusion could be reached as to whether the Item 20-1, Item 21-1, and Item 23 bullets were fired from the barrel of the Item 64 rifle or from the barrel(s) of the same firearm.

Item 27 and Item 28 are 12 gauge shotshell wads. Item 27 is physically consistent with shotshell wads loaded into 12 gauge Remington Gun Club and Remington Game load shotshells. Item 28 is physically consistent with shotshell wads manufactured by Maxam Corporation and loaded into 12 gauge Rio and Eley Hawk shotshells.

Item 56 and Item 58 consist of seven .22 Long Rifle caliber cartridges that bear the headstamps of Federal and CCI ammunition and are physically consistent with functional ammunition.

Item 20, Item 21, Item 22, Item 24 and Item 25 are metal fragments that bear no marks of value for comparison purposes.

Item 26 debris is unsuitable for comparison purposes.

Methods:

Physical and Visual Examinations

Physical and visual evaluations compare the physical and class characteristics of evidence items. A conclusion of "physically consistent with" is reached if the observable or measurable physical dimensions and/or design features of two items are in agreement, or are "physically consistent." If these dimensions and features are clearly different, an elimination conclusion is reached. If there is a lack of observable design features or measurable dimensions, the result is inconclusive.

Bullet Examination

Two bullets, either two evidence items or one evidence item and one bullet test fired in the Laboratory, undergo two stages of comparison. First, the bullets are examined to determine and compare their class characteristics. The class characteristics of fired bullets include diameter, number of land and groove impressions, direction of twist, and the widths of the land and groove impressions. If the class characteristics of the two bullets are not clearly different, the examination moves to a second stage using comparative microscopy.

A microscopic comparison examination consists of a search of the striated marks present on two bullets to determine if patterns of similarity exist. At the completion of these comparisons, one of the following three opinions is issued:

1) Source Exclusion

Source exclusion is an Examiner's conclusion that two bullets did not originate from the same source. The basis for a source exclusion conclusion is an Examiner's decision that two bullets can be differentiated by their class characteristics. A source exclusion based on general differences does not require a verification. However, a source exclusion based on a minor difference in a measured class characteristic requires a verification.

2) Source Identification

Source identification is an Examiner's conclusion that two bullets originated from the same source. Conditions for a source identification include the degree of similarity being greater than the Examiner has ever observed in previous evaluations of bullets known to have been fired from different barrels; and the degree of similarity is equivalent to that normally observed in bullets known to have been fired from the same barrel. The basis for a source identification conclusion is an Examiner's decision that the observed class characteristics and corresponding individual characteristics provide extremely strong support for the proposition that the two toolmarks came from the same source and extremely weak support for the proposition that the two toolmarks came from different sources. Before being reported, a source identification requires a verification to be completed.

3) Inconclusive (No Conclusion)

Inconclusive is an Examiner's conclusion that all observed class characteristics are in agreement but there is insufficient quality and quantity of corresponding individual characteristics such that the Examiner is unable to identify or exclude the two bullets as having originated from the same source. The basis for an inconclusive conclusion is an Examiner's decision that there is an insufficient quality and/or quantity of individual characteristics to identify or exclude. Reasons for an inconclusive conclusion include the presence of microscopic similarity that is insufficient to form the conclusion of source identification; a lack of any observed microscopic similarity; or microscopic dissimilarity that is insufficient to form the conclusion of source exclusion.

Cartridge/Shotshell Case

Two cartridge cases, either two evidence items or one evidence item and one cartridge case test fired in the Laboratory, undergo two stages of comparison. First, the cartridge cases are examined to determine and compare their class characteristics. The class characteristics of fired cartridge cases include caliber, shape of firing pin impression, shape and orientation of breech face marks, and relative locations of extractor and ejector marks. If the class characteristics of the two cartridge cases are not clearly different, the examination moves to a second stage using light and/or virtual comparison microscopy.

A microscopic comparison examination consists of a search of the impressed and striated toolmarks present on two cartridge cases to determine if patterns of similarity exist. At the completion of these examinations, one of the following three opinions is issued:

1) Source Exclusion

Source exclusion is an Examiner's conclusion that two cartridge cases did not originate from the same source. The basis for a source exclusion conclusion is an Examiner's decision that two cartridge cases can be differentiated by their class characteristics. A source exclusion based on general differences does not require a verification. However, a source exclusion based on a minor difference in a measured class characteristic requires a verification.

2) Source Identification

Source identification is an Examiner's conclusion that two cartridge cases originated from the same source. Conditions for a source identification include the degree of similarity, between two samples, being greater than the Examiner has ever observed in previous evaluations of cartridge cases known to have been fired in different firearms; and the degree of similarity is equivalent to that normally observed in cartridge cases known to have been fired in the same firearm. The basis for a source identification conclusion is an Examiner's decision that the observed class characteristics and corresponding individual characteristics provide extremely strong support for the proposition that the two toolmarks came from the same source and

extremely weak support for the proposition that the two toolmarks came from different sources. Before being reported, a source identification requires a verification to be completed.

3) Inconclusive (No Conclusion)

Inconclusive is an Examiner's conclusion that all observed class characteristics are in agreement but there is insufficient quality and quantity of corresponding individual characteristics such that the Examiner is unable to identify or exclude the two cartridge cases as having originated from the same source. The basis for an inconclusive conclusion is an Examiner's decision that there is an insufficient quality and/or quantity of individual characteristics to identify or exclude. Reasons for an inconclusive conclusion include the presence of microscopic similarity that is insufficient to form the conclusion of source identification; a lack of any observed microscopic similarity; or microscopic dissimilarity that is insufficient to form the conclusion of source exclusion.

Firearms Function

The make, model, and caliber of a firearm are normally determined by directly observing manufacturer markings on the firearm in question. When these are not present, published materials and firearms in the Laboratory's Reference Firearms Collection may be used to make determinations.

Unless otherwise noted, submitted firearms are test fired:

1) in the condition they are received in the Firearms/Toolmarks Unit,
2) with ammunition from the Laboratory's Reference Ammunition File,
3) in a manner that allows for testing of available modes of fire such as manual safety engaged, manual safety disengaged, single action, double action, semi-automatic, fully automatic, etc.

NCIC

The serial number from a firearm is queried against the Department of Justice National Crime Information Center (NCIC) stolen gun record database. This database contains records on stolen, lost, and recovered firearms and firearms used in the commission of crimes.

NIBIN

When a NIBIN entry is performed for a submitted firearm, an image of a test-fired cartridge case from that firearm is entered in the NIBIN database. An image of a representative sample of any submitted cartridge cases that have not been associated with a specific firearm are also entered in the NIBIN system. Entries are searched against the appropriate regional database(s), and correlation results are viewed to determine possible associations.

Limitations:

Physical and Visual Examinations

A Physical and Visual Evaluation examination is unsuitable for determining a source identification conclusion. A conclusion of "physically consistent with" signifies a restricted group source, based on class characteristics and/or observable features, from which evidence may have originated. Post-manufacture features cannot be used for elimination purposes.

Bullet Examination

Firearms/Toolmark Identification is an empirical science that relies on objective measurements and a subjective comparison of microscopic marks of value. Due to random changes in barrels such as wear, corrosion and lead and jacket material accumulation, bullets fired from the same barrel are sometimes not identifiable as such. Additionally, some barrel manufacturing methods routinely produce barrels that leave limited microscopic marks of value on fired bullets. Additionally, damaged, corroded or fragmented bullets may be of little or no value for comparison purposes.

Cartridge/Shotshell Case

Firearms/Toolmark Identification is an empirical science that relies on objective measurements and a subjective comparison of microscopic marks of value. Due to possible changes in firearm operating surfaces from wear, corrosion, and ordinary fouling and differences in ammunition design and construction, cartridge cases fired in the same firearm are sometimes not identifiable as such. Additionally, some firearm manufacturing methods routinely produce working surfaces that leave limited microscopic marks of value on fired cartridge cases.

Virtual comparison microscopy (VCM) is restricted to the surface that the three-dimensional toolmark topographical instrument is capable of measuring to produce a digital reproduction. Additionally, individual characteristics may be present on the evidentiary item(s) and may not be reproduced during a scan. This may be due to interference from lacquer/sealant, environmental damage, debris, or measuring limits for an instrument. Furthermore, physical characteristics that are not measurable, such as the metallic qualities of an item, may not be available for evaluation.

Firearms Function

The results of firearms function examinations describe the operating condition of the firearm as received in the Firearms/Toolmarks Unit.

NCIC

The NCIC stolen gun record will only return a record if the serial number queried matches a database entry and the information is available. Additionally, an NCIC search may

return a record containing information that does not match the description of the firearm being queried.

NIBIN

Due to a number of variables regarding image capture and data entry, NIBIN searches may not always locate entries that were fired in the same firearm.

Additionally, the algorithm used in NIBIN merely provides a sorting capability for potentially associated toolmarks represented on cartridge cases and provides no statistical confidence in possible matching results.

Remarks:

For questions about the content of this report, please contact Forensic Examiner Michael Van Arsdale at 703-632-8809.

For questions about the status of your submission, including any remaining forensic examinations, please contact Heather Busch at 703-632-8221.

The evidence, which includes secondary evidence, will be returned under separate cover.

The conclusions in this report conform to the "Department of Justice Uniform Language for the Forensic Firearms/Toolmarks Discipline - Pattern Match Examinations".

This report contains the opinions and interpretations of the issuing examiner(s) and is supported by records retained in the FBI Laboratory files. Please allow a minimum of thirty days from the date of a discovery request for the FBI Laboratory to provide the related materials. The FBI cannot ensure timely delivery of discovery requests received in less time.

The work described in this report was conducted at the Quantico Laboratory.

Michael Van Arsdale
Firearms/Toolmarks Unit